

Package: SLTCA (via r-universe)

September 17, 2024

Type Package

Title SLTCA: Scalable and Robust Latent Trajectory Class Analysis
Using Artificial Likelihood

Description Conduct latent trajectory class analysis with longitudinal
observations.

Depends R (>= 3.3.0)

Imports stats, geepack, VGAM, Matrix

Version 0.1.0

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Encoding UTF-8

LazyData true

RoxygenNote 6.0.1

Repository <https://tengfei-emory.r-universe.dev>

RemoteUrl <https://github.com/tengfei-emory/sltca>

RemoteRef HEAD

RemoteSha ba768bc73c8d8c57fb00d63a0da81c48a2057b01

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simulation

Simulate a dataset which can be analyzed by SLTCA

Description

Simulate a dataset with longitudinal observations.

Usage

```
simulation(n)
```

Arguments

n Sample size.

Value

Returns a data frame with 6 longitudinal features y.1 - y.6, including count (y.1 and y.2), binary (y.3 and y.4) and continuous (y.5 and y.6) type. Variable `baselinecov` is the baseline risk factor of latent classes. Variable `latent` is the true latent class labels.

Author(s)

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Examples

```
dat <- simulation(500)
```

SLTCA

SLTCA: Scalable and Robust Latent Trajectory Class Analysis Using Artificial Likelihood

Description

Conduct latent trajectory class analysis with longitudinal observations.

Usage

```
SLTCA(k = 20, dat, num_class, id, time, num_obs, features, Y_dist, covx, ipw,
      stop, tol = 0.005, max = 50, varest = T, balanced = T, MSC = "EQIC",
      verbose = T)
```

Arguments

k	Number of random initialization to start the algorithm.
dat	Input data matrix.
num_class	Number of latent classes in the fitted model.
id	Column name in the data matrix 'dat' for the patient id.
time	Column name in the data matrix 'dat' for the time of longitudinal observations.
num_obs	Column name in the data matrix 'dat' for the number of longitudinal observations (number of visits).
features	A vector of column names in the data matrix 'dat' for the longitudinal observations.
Y_dist	A vector indicating the type of longitudinal observations. An element of Y_dist can be 'normal', 'bin', and 'poi' for continuous, binary and count data.
covx	A vector of column names in the data matrix 'dat' for baseline latent class risk factors.
ipw	Column name in the data matrix 'dat' for the inverse probability weights for missingness. ipw=1 if not specified.
stop	Stopping criterion for the algorithm. stop can be either 'tau' based on posterior probabilities or 'par' based on point estimation.
tol	A constant such that the algorithm stops if the stopping criterion is below this constant.
max	Maximum number of iterations if the algorithm does not converge.
varest	True or False: whether conduct variance estimation or not.
balanced	True or False: whether the longitudinal observations are equally spaced.
MSC	Model selection criteria: 'AQIC', 'BQIC' or 'EQIC'.
verbose	Output progress of fitting the model.

Value

A list with point estimates (alpha, beta0, beta1, phi, gamma), variance estimates (ASE), posterior membership probabilities (tau) and QICs (qic) of the latent trajectory class model.

Author(s)

Teng Fei. Email: tfei@emory.edu

References

Hart, Fei and Hanfelt (202x), Scalable and Robust Latent Trajectory Class Analysis Using Artificial Likelihood (in press).

Examples

```
dat <- simulation(500)

res <- SLTCA(k=1,dat,num_class=2,"id","time","num_obs",paste("y.",1:6,sep=' '),
            Y_dist=c('poi','poi','bin','bin','normal','normal'),
            "baselinecov",1,stop="tau",tol=0.005,max=50,
            varest=T,balanced=T,MSC='EQIC',verbose=T)
```

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